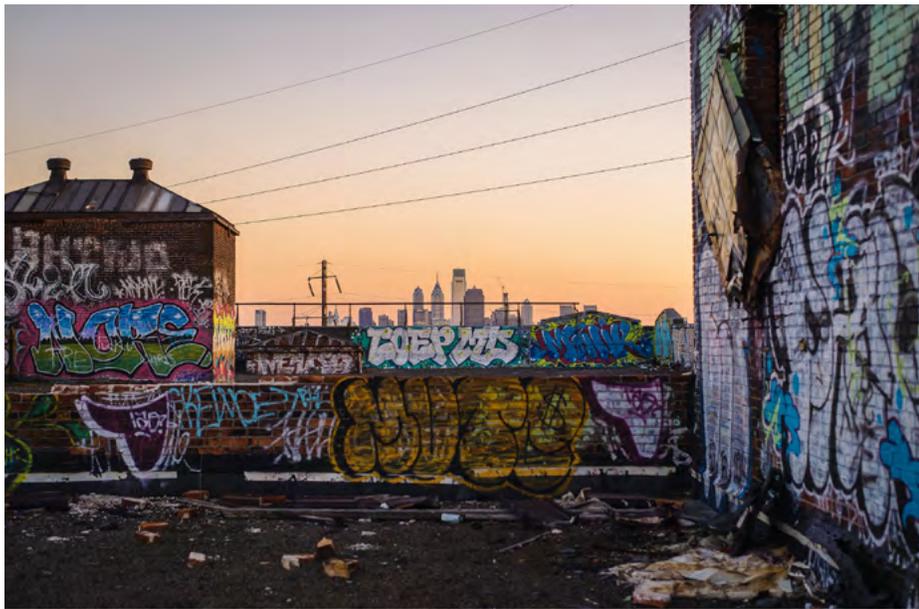




Going Local: A Place-Based Approach to Reducing Urban Gun Violence



Following improvements in several blighted neighborhoods in Philadelphia, firearm assault frequency significantly decreased. Photo by Fredy Martinez via Unsplash.

SUMMARY

Scientists at the Northern Research Station are studying the connection between urban greening, public health, and crime. One recent study found that firearm assault frequency decreased following improvements to abandoned buildings and vacant lots. Another study that focused on Philadelphia gunshot crime survivors found that the likelihood of being assaulted was lower when people were under tree cover as opposed to when they were out in the open. A third study determined that neighborhood improvements had a lower financial cost than the gun-related crime that the improvements helped to prevent. Since many U.S. cities have plans in place to increase citywide tree canopy levels and improve green stormwater infrastructure, this research may help city land managers to prioritize spending and work with nongovernment organizations to maximize environmental, economic and social benefits.

From National Forests to Urban Ecosystems

When the USDA Forest Service was created more than 100 years ago, its focus was on the country's vast forest reserves. Gifford Pinchot, the country's first chief forester, worked with Theodore Roosevelt to triple the nation's forest reserve acreage, mostly west of Denver. Although it's tempting to picture Gifford Pinchot somewhere in the wilds of Montana or Oregon, surrounded by old-growth trees, it's interesting to remember that his roots were solidly urban: A native of Connecticut, Pinchot was the grandson of one of New York City's wealthiest real estate developers.

Today, the connection between rural and urban land management is stronger than ever at the Forest Service, particularly in the Northern Research Station's urban field stations. These field stations, located in Philadelphia, Baltimore, Chicago, and New York City, were created to improve the quality of life in urban and urbanizing areas through scientific research, collaboration, and communication. One area of research is the connection between natural resources and urban safety issues, including gun violence.

Looking at Where Gun Violence Occurs

As recently as 2015, guns were used to kill more than 13,000 people in the United

States, while nearly 27,000 Americans were injured. But gun-related crimes are not evenly distributed: Half of America's gun homicides in 2015 were clustered in fewer than 130 cities and towns. Within these cities, most gun homicides occur in neighborhoods with intense poverty, racial segregation, and low education levels. Though these neighborhood areas contain just 1.5% of the U.S. population, they are the location of more than 25% of America's gun homicides.

In recent years, high-profile firearm violence has resulted in national debate about ways to reduce gun-related crime, including background checks for gun sales and bans on assault weapons. Most

attempts to reduce U.S. firearm violence have focused on the guns themselves, the users of firearms, or the victims of firearm violence. But despite the concentration of gun crimes in specific neighborhoods, few approaches to gun crime reduction take a neighborhood-based approach.

Taking a New Approach

In several U.S. cities, including Philadelphia, Baltimore, and Cincinnati, Forest Service scientists are conducting research to address gun violence on a local level. These scientists are finding the connections between gun violence and neighborhood conditions—particularly trees. Through their work, these researchers are helping to identify how street-level improvements can reduce gun violence in neglected, low-income urban neighborhoods where crime levels tend to be the highest.



Street-level improvements have been linked to lower levels of gun-related crime in Philadelphia. Photo from University of Pennsylvania Urban Health Lab, used with permission.

One of these researchers is Michelle Kondo, a research social scientist with the Forest Service's Northern Research Station at the Philadelphia Field Station. Kondo and others focus on what they call "place-based" influences on public health and safety, looking for connections between crime, urban abandonment, and blight. According to Kondo, "Neglected, deteriorating built environments have a negative influence

on people and on how they feel about themselves and about others. On the other hand, environments that appear cared-for, or environments that are green, can impact our physiology—our stress levels, our mental health, cardiovascular health, our ability to focus our attention—and promote positive connections with our neighbors."

Crime Levels and Neighborhood Improvements

In one recent study, Kondo and others looked at how improvements to abandoned buildings and vacant lots affected gun-related crime levels in underserved neighborhoods. Using dates and locations from the Philadelphia Police Department, Forest Service researchers found that, following the improvements, firearm assault frequency significantly decreased.

Kondo and her team then set out to determine the cost-benefit to the city. They compared remediation and maintenance costs to gun-related crime costs such as property damage, medical expenses, and criminal justice costs. As Kondo explains, "Gun violence victims experience physical injuries, premature death, and adverse health behaviors and outcomes including depression, post-traumatic stress disorder,

KEY FINDINGS

- Scientists at the Northern Research Station and elsewhere are studying the connection between urban greening, public health and crime.
- One recent study found that improvements to abandoned buildings and vacant lots have reduced the frequency of firearm assaults.
- Another study found that the likelihood of gun assault was lower when people were under tree cover as opposed to when they were out in the open.
- Neighborhood improvements have a lower average financial cost than the gun-related crime that the improvements helped to prevent.

MANAGEMENT IMPLICATIONS

- Cities spend a disproportionate amount of money on law enforcement.
- Increased spending on law enforcement and related expenses often results in reduced spending for social services, infrastructure and other urban needs.
- Many municipal governments will not proceed with certain neighborhood improvements without a return-on-investment study.
- Recent research indicates that landscape and infrastructure improvements in underserved, high-crime urban neighborhoods can transform communities, save lives, and provide more than a full return on investment to taxpayers and their communities.
- Since many U.S. cities have plans in place to increase city-wide tree canopy levels and improve green stormwater infrastructure, Forest Service research may help city land managers to prioritize spending and work with non-government organizations to maximize environmental, economic and social benefits.



substance abuse, and suicidal tendencies. There's also an enormous economic cost. Gun violence is estimated to cost the United States more than \$48 billion in medical and work loss costs annually."

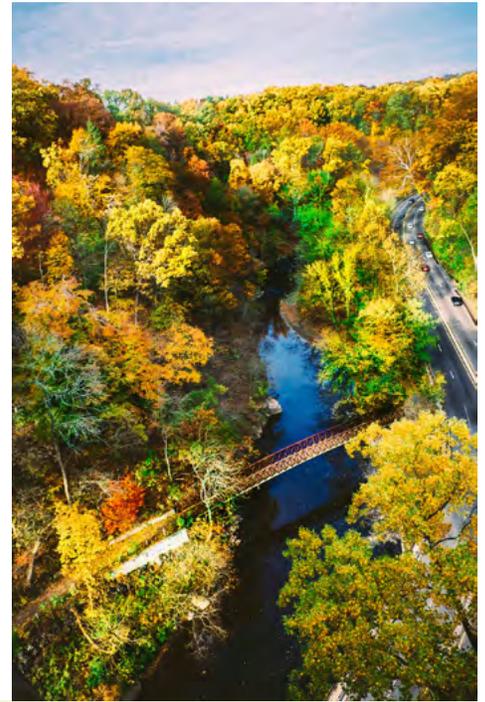
Not surprisingly, Kondo and the other researchers found that neighborhood improvements had a lower price tag than the gun-related crime that the improvements helped to prevent. According to Kondo, "Violence interventions that target individuals are often very expensive and have a low rate of success because they take a large concerted and sustained effort to change on the part of individuals. But changing and improving environments generally takes no effort on the part of individuals, can be relatively low-cost, and can have a positive influence on a much greater number of people."

A City Budget Perspective

Charles Branas, a key Kondo collaborator and the chair of the Department of Epidemiology at Columbia University's Mailman School of Public Health, points out that cities spend a huge amount of money on law enforcement. According to a recent U.S. News & World Report article, the cities of Chicago, Minneapolis, and Oakland all spent more than 35 percent of their general funds on police services in 2017. Nationwide, these numbers are rising, often



Like most cities, Philadelphia's neighborhoods have very different levels of tree canopy. City managers want to raise the city average to 30% from its current level of 20%. Photos by Connor Ellsworth (at left) and Sallie Michalsky via Unsplash.



resulting in reduced spending for social services, infrastructure, and other urban needs.

Despite these facts, many municipal governments will not proceed with certain neighborhood improvements without a return-on-investment study. Branas explains, "When gun violence is averted, there's a significant financial value, as well as lasting benefits to the community.

Our research demonstrates sustainable, replicable strategies that can transform communities across the country, save lives, and provide well more than a full return on investment to taxpayers and their communities."

Branas adds that reducing gun violence is more than a financial issue. He explains, "There's a ripple effect that occurs when a gun goes off on a street corner. People may die, people may move out of the neighborhood, property values can drop. There is a tangible pain and void left when lives are lost to firearm violence."



In 2017 the U.S. Environmental Protection Agency signed a statement of intent supporting and encouraging green stormwater improvement projects to meet federal regulatory standards. Photo from U.S. Environmental Protection Agency



Street tree stumps and boarded-up windows haunt a commercial strip in Philadelphia's Haddington neighborhood. Photo from the Preservation Alliance for Greater Philadelphia, used with permission.

demographically similar but uninfested neighborhoods. In Kondo's words, "Invasive tree pests like the emerald ash borer may have social costs that are worth considering."

Haddington: A Sense of Community

One Philadelphia neighborhood that has seen positive change as a result of greening efforts is Haddington, which is located in the West Philadelphia section of the city. Haddington, which has many two-story row homes, some Victorian houses, and a historic district, has had a high percentage of working-class African Americans since the 1950s. In recent decades, housing discrimination made it difficult for many residents to own property, and social unrest contributed to increased substance abuse and gang activity.

Since 1989, a community nonprofit organization called Urban Tree Connection has worked to promote community engagement in low-income areas such as Haddington through greening efforts, including gardening and farming. Since 2001, Urban Tree Connection has created gardens on 29 different community lots, totaling 2.5 acres of land within a 10-block radius. One of these is called Memorial Garden, which was built following the fatal shooting of four neighborhood teenagers.

Urban Tree Connection executive director Noelle Warford explains, "Our founder was a landscape architect who had a vision for what the old neighborhoods could become. Back when we started, the residents began to identify lots that were vacant, were used for dumping, or were places where there was unwanted behavior. One abandoned house had squatters; we were able to clear the lot and create a corner garden."

As a result, Warford reports an improvement in what she calls "social cohesion." She says, "One of the places where you can feel it the most is around the Conestoga Street garden,

which is next to public housing. It's been there for 15 years now so kids have grown up in that space. You can really feel the sense of community there."

Prioritizing Tree Canopy Improvement Projects

These stories are particularly interesting when you consider that Philadelphia and other cities have implemented a target tree canopy percentage in order to benefit ecology, economy, and quality of life. (Tree canopy is defined as the layer of leaves, branches, and stems of trees that cover the ground when viewed from above.) In Philadelphia, which has about 20% tree canopy cover, the goal is 30%.

As with many other cities, Philadelphia's canopy percentage varies widely by neighborhood. For example, according to a 2011 report, Philadelphia's Chestnut Hill and Germantown neighborhoods slightly exceed the 30% target while Chinatown North and South Philadelphia are only 3% covered by tree canopy. Philadelphia and other cities may be able to maximize the social benefit of tree-planting by looking not just at where the tree canopy is thinnest, but where a low tree canopy is accompanied by higher-than-average crime rates.

These kinds of projects create an opportunity for cities to not only improve their infrastructure and canopy percentages but to improve social conditions on a



The Pennsylvania Horticultural Society trains and supports dozens of volunteer-operated, neighborhood-based nonprofit organizations that help tree-planting efforts in and around Philadelphia. Photo from the Pennsylvania Horticultural Society, used with permission.



neighborhood level. Kondo believes that the future holds many opportunities for evaluating how economically reasonable, place-based greening programs can improve public health and safety.

Transforming Neighborhoods with Tree Tenders

The Philadelphia-based Pennsylvania Horticultural Society is a driving force in this effort. While PHS is best known as the organization that puts on Philadelphia's world-renowned annual flower show, they also lead one of the longest-running volunteer urban tree planting and stewardship programs in the world. Glen Abrams, PHS's director of sustainable communities, describes the program this way: "We run a program called Tree Tenders that trains community residents to plant and care for trees in their neighborhoods. These volunteers typically plant between 800 and 1,000 trees every year, about 90% of which are in public places. One of the social benefits is that tree planting is a good

way to engage people in a neighborhood improvement activity: It's neighbor meeting neighbor and sharing a common goal to improve the neighborhood."

A few years ago, PHS compiled city data to prioritize planting opportunities around Philadelphia. Based on local and federal data set and mapping technology, PHS evaluated the city street by street, based on factors such as low tree canopy, high population density, low household income, and high crime levels. Dozens of neighborhood-based Tree Tenders groups use this information to prioritize planting efforts around the city.

One Tree Tenders group, called Philly Tree People, has planted more than 1,000 trees in northeast Philadelphia neighborhoods such as Kensington and Fishtown. Group cofounder Jacelyn Blank says, "I'm a nature person, and I know I feel calmer and more peaceful in a natural environment. There are places where the trees have improved the feel of the neighborhoods, as well as how people feel about living there. It's making a difference."



Green stormwater infrastructure projects have been connected with improved quality of life in underserved urban neighborhoods. Photo from U.S. Environmental Protection Agency.

FURTHER READING

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USDA Forest Service scientists work at the forefront of science to improve the health and use of our nation's natural resources, as well as as well as our nation's forest and grasslands. More information about the Northern Research Station can be found here: <https://nrs.fs.fed.us>

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–Michelle Kondo



WRITER'S PROFILE

BRIAN COOKE is a science writer for the Northern Research Station. Currently based out of Fort Collins, Colorado, Cooke is a Pennsylvania native with a degree in journalism-science writing from Lehigh University. Brian has also completed writing assignments for the Rocky Mountain Research Station, the National Park Service, History Colorado, and various environmental services companies and Bureau of Land Management contractors. Brian's science and environmental writing is frequently colored by his National Park Service interpretive training and experience as a volunteer docent for Alcatraz Island National Historic Landmark and San Francisco Maritime National Historical Park.

SCIENTIST PROFILES



MICHELLE KONDO is a research social scientist with the USDA Forest Service's Northern Research Station at the Philadelphia Field Station. Her research interests include environmental strategies for violence, injury, and disease prevention; environmental health and environmental justice; and geospatial and community-based research methods. She is also an Associate Fellow at the University of Pennsylvania's Center for Public Health Initiatives. Kondo has a Ph.D. in urban design and planning and a master's degree in urban planning from the University of Washington and a bachelor's degree in civil and environmental engineering from Carnegie Mellon University.



CHARLES BRANÁS is the epidemiology department chair at Columbia University's Mailman School of Public Health and the faculty director of the University of Pennsylvania's Urban Health Lab. He has conducted research that extends from urban and rural areas in the United States to communities across the globe, incorporating place-based interventions and human geography. Landmark Supreme Court decisions, the U.S. Congress, and the director of the National Institutes of Health have cited his research on the factors that underpin gun violence. Branäs received a Ph.D. from Johns Hopkins University, a master's degree from Drexel University and a bachelor's degree from Franklin & Marshall College.

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